

WHAT IS CLAIMED IS:

1. A method of inhibiting tumor growth in an animal,
comprising the step of administering a vector encoding mPer2
5 protein to said animal.

2. The method of claim 1, wherein said vector is a
plasmid vector or a viral vector.

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3. A method of increasing DNA repair in an animal,
comprising the step of administering a vector encoding mPer2
protein to said animal.

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4. The method of claim 3, wherein said vector is a
plasmid vector or a viral vector.

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5. A method of diagnosing a neoplastic condition in an individual based on the expression of a circadian clock controlled gene in a light/dark cycle, wherein said gene regulates cell division cycling and said method comprises the step of:

5 comparing the expression of said circadian clock controlled gene in a light/dark cycle in a normal individual to the expression of said circadian clock controlled gene in a light/dark cycle in a tested individual suspected of having a neoplastic condition, wherein change of expression of said circadian clock

10 controlled gene in said tested individual compared to said normal individual indicate said tested individual has a neoplastic condition.

6. The method of claim 5, wherein said circadian clock controlled gene is selected from the group consisting of c-Myc, Cyclin D, Cyclin A, Mdm2 and Gadd45 α .

7. The method of claim 5, wherein said change of expression of said circadian clock controlled gene is selected from

the group consisting of increased gene expression level, decreased gene expression level and different kinetic of gene expression.

5 8. A method of treatment of cancer by manipulation of circadian clock function, comprising the step of synchronization of cancer and non-cancer cells by drug molecules or hormones.

10 9. The method of claim 8, wherein said hormone is glucocorticoid.